

REMARKS

The Office Action dated January 21, 2003 and the cited references have been carefully considered. Claims 1-18 are pending. The Examiner rejected claims 1-4, 9-12, 17 and 18 under 35 U.S.C § 103(a) as being unpatentable over Clarke et. al. (US patent 4,920,385; hereinafter "Clarke") in view of Lewis et. al. (US patent 5,528,368; hereinafter "Lewis") and further in view of Gill et. al. (US patent 5,149,547; hereinafter "Gill"). According to the Examiner, it would have been obvious to one having ordinary skill in the art, at the time claimed invention was made, to modify teachings of Clark relating to an electro-optical system for identifying defects in manufactured materials including plastic parts, with teachings of Lewis relating to use of a spatially-resolved spectrometer and spectroscopic imaging techniques for collecting data by reading reflected light from material samples. The Examiner also stated that, teachings of Clark can be further modified with teachings of Gill relating to molding tool for producing plastic parts, to realize claimed invention. Next, the Examiner rejected claims 5, 7, 13 and 15 under 35 U.S.C § 103(a) as being unpatentable over Clark in view of Lewis, in further view of Gill and Official Notice. According to the Examiner, limitations recited in claims 5, 7, 13 and 15 merely addresses limitations relating to "obvious and well known techniques" commonly used in signal data processing and hence would have been used by one skilled in the art to realize the claimed invention. The Examiner objected to claims 6, 8, 14 and 16 being dependent on a rejected base claim. The Examiner also mentioned that claims 6, 8, 14 and 16 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 19-22 have been appended in this amendment to address above comments made by the Examiner. Additionally claim 1 and claim 9 have been amended in this amendment.

Rejections under 35 U.S.C. § 103(a)

Claims 1-4, 8, 9-12, 17 and 18

The Examiner rejected claims 1-4, 8, 9-12, 17 and 18 under 35 U.S.C § 103(a) as being unpatentable over Clark in view of Lewis and further in view of Gill. According to the Examiner, it would have been obvious to one having ordinary skill in the art at the time claimed invention was made, to modify the teachings of Clark with teachings of Lewis and Gill to realize claimed invention. Applicants respectfully traverse these rejections in light of amended independent claims 1 and 9 respectively.

Solution of a long-felt need or problem is often a very essential element in a claimed invention, even though the problem, once realized, may be solved by use of old and known elements. The nature of the problem persisting in the related art, and the inventor's solution, are factors to be considered in determining whether the invention would have been rendered obvious "as a whole" to a person of ordinary skill in the art. Consideration of such new and useful solution negates motivation to combine references towards establishing *prima facie* case of obviousness. Hence, such considerations should be viewed from a perspective integral to the "subject matter as a whole" while analyzing obviousness of the claimed invention within scope of 35 U.S.C. § 103(a).

Clark teaches a method for detecting defects on a sample of a molded surface under inspection, by estimating deviation or shift between light rays incident on the sample surface and light rays reflected therefrom, using photo-sensitive image position detectors. On the other hand, Lewis teaches a method for collecting and manipulating spectroscopic data sets from the sample surface subjected to inspection, so that precise molecular arrangements, particularly subtle topological configurations of the sample surface not easily visible otherwise, can be revealed. Briefly, Lewis accomplished the objective to capture such precise topological features by using an acousto-optic tunable filter (herein after "AOTF") coupled with a two-dimensional array detector. The AOTF

detector. The AOTF combined with the two-dimensional array detector resolves image of the sample surface captured by the spectrometer with fine spatial resolution. Such fine spatial resolution of the image generates massive volume of data for subsequent analysis. Looking at Gill's teaching, it can be summarized that Gill recites a system and method to individually control and meter plastic raw material into mold cavities of a multiple cavity injection molding system to facilitate manufacturing of plastic components. Such multiple cavity injection molding system recited by Gill readily allows production of multiple plastic components of varying shapes and sizes within a single injection mold or tool.

Moving to the claimed invention, Applicants disclosed an apparatus and method for quantitative assessment of defects, flaws, or streaks in the sample surface, such as molded plastic parts, using a spatially-resolved spectrometer. Moreover, the Applicants attempted to solve the problem of handling massive initial data volume generated during spectroscopic analysis of the sample surface, particularly for complex, curved or textured portions thereof. As may be appreciated, such massive initial data volume includes substantial amount of noise or irrelevant data. Applicants recited that automatic filtering of such initial data volume is essential to generate a relevant data set subjected to further quantitative analysis in terms of parameters, such as, for example, overall data shape and average "peak or valley shift." As further recited by the Applicants, quantitative analysis of the relevant data set aids to determine a "quality number" for categorizing and ranking the sample surface in accordance with nature of topological defects or streaks present therein. It is established that Lewis focuses only on generating and analyzing data irrespective of the volume and relevancy of data, indicating absence of motivation "as a whole" to combine with teachings of Clark for addressing need to generate and process such relevant data set. As recited by the Applicants, such relevant data set filtered out from the initial volume of data is processed further for arriving at a quantitative index to evaluate topological quality of the sample surface in terms of parameters such as "quality number."

Furthermore, Applicants used a molding tool (depicted in Fig 2 and Fig. 3 of the claimed invention) that includes certain pre-determined topological features so that typical streaking phenomenon can be simulated on a laboratory scale. Based on such simulation, optimum process conditions for manufacturing the molded parts such as, for example, temperature and extrusion rate, can be predicted so that the molded parts are produced with minimum or acceptable streaking. Such simulation saves time and expense of wasteful production runs. Hence, Gill's model for production of multiple plastic components of varying shapes and sizes within a single injection mold or tool, lacks any teaching or suggestion to combine with Clark and Lewis for motivating the Applicants to look for manufacturing related preventive aspects towards minimizing topological defects or streaking of the plastic parts produced.

In accordance with reasons set forth above, Applicants respectfully submit that amended independent claims 1, 9 and original independent claim 17 are in full compliance with requirements of 35 U.S.C §103(a). Withdrawal of rejection of independent claims 1, 9 and 17 are respectfully requested.

Claims 2-4 depend from amended independent claim 1. Claims 10-12 depend from amended independent claim 9. Claim 18 depends from independent claim 17. Accordingly, claims 2-4, 10-12 and 18 are believed to be allowable for reasons stated above. Withdrawal of rejection of claims 2-4, 10-12 and 18 under 35 U.S.C §103(a) is respectfully requested.

Claims 5, 7, 13 and 15

The Examiner rejected claims 5, 7, 13 and 15 under 35 U.S.C § 103(a) being unpatentable over Clark in view of Lewis, in further view of Gill and Official Notice. According to the Examiner, limitations recited in claims 5, 7, 13 and 15 merely addresses limitations relating to "obvious and well known techniques" commonly used in signal

data processing schemes and hence would have been used by one skilled in the art to realize the claimed invention. Applicants respectfully traverse these rejections.

Official Notice may be taken only of facts, which are capable of such instant and unquestionable demonstration as to defy dispute. Therefore, if the facts are disputable or the results disclosed in the instant application are not always obtained when such alleged facts are applied to the claimed invention, Official Notice may not be taken of the alleged facts. Essentially, the Examiner has taken Official Notice of facts outside of the record that the Examiner apparently believes are capable of demonstration as being "well-known" in the art.

Applicants recited means to remove statistically insignificant color variations of image of the sample part, from one linear position to the next linear position across a spectral space domain captured by the spatially-resolved spectrometer. It is desirable to filter out such statistically insignificant color variations prior to performing any signal processing or image analysis so as to obtain true value of image parameters such as, "peaks" and "valleys" for example, over the spectral space domain captured for each sample. The references cited by the Examiner never address this issue as discussed above. Small fluctuations in chromaticity parameters indiscernible to human eye are filtered out by a means recited by the Applicants. Such filtering means includes a multi-linear fit to a series of points across the spectral space domain captured by the spatially-resolved spectrometer. It is established that, Examiner's apparent assertion of what is "obvious and well known in the art" is a significant logical leap from the actual teachings of the cited references. Therefore, the Official Notice taken by the Examiner is disputable when applied in context of the present invention. Applicants hereby traverse the Examiner's use of Official Notice and respectfully request that the Official Notice is waived for claims 5, 7, 13 and 15 respectively.

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It has already been discussed before in sufficient details that it is not obvious to a person having ordinary skill in the art at the time invention was made, to modify Clark in view of Lewis, and further in view of Gill to realize the claimed invention. Accordingly, amended claims 1 and 9 are believed to be allowable within scope of 35 U.S.C 103(a). Claims 5 and 7 depend from claim 1 whereas claims 13 and 15 depend on claim 9. In accordance with reasons set forth above, Applicants respectfully submit that claims 5, 7, 13 and 15 are in full compliance with requirements of 35 U.S.C §103(a). Withdrawal of rejection of claims 5, 7, 13 and 15 under 35 U.S.C §103(a) is respectfully requested.

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Conclusion

In view of the remarks set forth above, allowance of the pending claims is respectfully requested. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

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Respectfully submitted,



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